and further wherein computing a value of log(x) for the binary floating point representation of the particular number x comprises the steps of:

partitioning a mantissa m of a binary representation of x in a memory, the representation of x including a binary exponent e and the binary mantissa m, wherein a first, most significant part of the partition corresponds to a region i and a second, less significant part of the partition corresponds to a region Δx, where Δx is a distance from mantissa m to reference point

$$a_i = 1 + \frac{i + 0.5}{N}; \text{ and}$$

computing an approximation to log(x), using a polynomial of first degree in m and a precomputed value of log(a_i).

5.   (once amended) A method in accordance with Claim 32 further comprising the steps of precomputing a value for log(2), and, for each i, precomputing each value of b_i and c_i.

8.   (once amended) A method in accordance with Claim 31 utilized in a computed tomography (CT) scanner for generating an image of an object from acquired projection data of the object.

13.   (once amended) A method in accordance with Claim 33 further comprising the steps of precomputing a value for log(2), and, for each i, precomputing each value of b_i and c_i.

19.   (once amended) A computing device in accordance with Claim 33 further configured to precompute a value for log(2), and, for each i, to precompute each value of b_i and c_i.

27.   (once amended) A computing device in accordance with Claim 34 further configured to precompute a value for log(2), and, for each i, to precompute each value of b_i and c_i.

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29. (once amended) A method in accordance with Claim 31 further comprising using the approximation to process at least one image of an object of interest.

PLEASE ADD THE FOLLOWING NEW CLAIMS:

31. A method for computing an approximation of a natural logarithm function comprising the steps of:

partitioning a mantissa region between 1 and 2 into N equally spaced sub-regions;

precomputing centerpoints a_i of each of the N equally spaced sub-regions, where $i = 0, ..., N-1$;

selecting N sufficiently large so that, for each sub-region, a first degree polynomial in m computes $\log(m)$ to within a preselected degree of accuracy for any m within the sub-region, where m is a binary mantissa of a binary floating point representation of a number; and

computing a value of $\log(x)$ for a binary floating point representation of a particular number x stored in a memory of a computing device utilizing the first degree polynomial in m.

32. A method in accordance with Claim 2 wherein computing an approximation to $\log(x)$ comprises the step of computing an approximation written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + e \times \log(2)$$

for $i = 0, ..., N-1$

where:

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$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 - \left(1+\frac{1}{2N}\right)\frac{1}{a_i}; \text{ and}$$

$$c_i = -1/a_i.$$

33. A method in accordance with Claim 10 wherein computing an approximation to $\log(x)$ comprises the step of computing an approximation written as:

$$y = -\log(x) \approx b_i + c_i\Delta x + e \times \log(2)$$

for $i = 0,\ldots,N-1$

where:

$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 - \left(1+\frac{1}{2N}\right)\frac{1}{a_i}; \text{ and}$$
$$c_i = -1/a_i.$$

34. A computing device in accordance with Claim 16 wherein said device being configured to compute an approximation to $\log(x)$ comprises said device being configured to compute an approximation written as:

$$y = -\log(x) \approx b_i + c_i\Delta x + e \times \log(2)$$

for $i = 0,\ldots,N-1$

where:

$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 - \left(1+\frac{1}{2N}\right)\frac{1}{a_i}; \text{ and}$$
$$c_i = -1/a_i.$$

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35. A computing device in accordance with Claim 24 wherein said device being configured to compute an approximation to log(x) comprises said device being configured to compute an approximation written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + e \times \log(2)$$

for $i = 0, ..., N-1$

where:

$$b_i = -\log(a_i) + \left(\frac{1}{4a_i N}\right)^2 - \left(1 + \frac{1}{2N}\right)\frac{1}{a_i}; \text{ and}$$

$$c_i = -1/a_i.$$

Remarks

The Office Action mailed February 12, 2003 has been carefully reviewed and the foregoing amendment has been made in consequence thereof. Submitted herewith is a Submission of Marked Up Claims.

In accordance with 37 C.F.R. 1.136(a), a two-month extension of time is submitted herewith to extend the due date of the response to the Office Action dated February 12, 2003, for the above-identified patent application from March 12, 2003, through and including May 12, 2003. In accordance with 37 C.F.R. 1.17(a)(2), authorization to charge a deposit account in the amount of $410.00 to cover this extension of time request also is submitted herewith.

Claims 2-3, 5-11, 13-17, 19-25, and 27-35 are now pending in this application. Claims 1-28 stand rejected. Claims 1, 4, 12, 18 and 26 have been cancelled due to typographical errors and rewritten as new Claims 31-35 respectively. Accordingly, all arguments made with respect